

Numbers & Oddities; the early days: February 1995-September 1995.

Although the following article was not published in the N&O column but in the 'Digital Review' column, I just had to include it here because this is the rewritten and updated article about the FAPSI stations published in the WUN newsletter from June 1997.

Russian diplo/intelligence [SOUD update 20-6-1997]

We introduced you to the 'Brotherhood/SOUD' network via a special edition of the WUN newsletter in March 1995. Lots of updates have been published since that date -mostly new schedules and stations- and numerous logs have popped up with various id's, such as BROTHERHOOD, SOUD, DoSC and lately also SVR and FAPSI. As SOUD doesn't exist anymore, I think it is time for a major update. For those of you who are unfamiliar with this network, I suggest that you catch up with the story by reading WUN newsletters vol.1 nos.3 and 6 first. This update starts with a short who-is-who in Russian intelligence, followed by network specifics.

As you probably all know, the KGB does not exist anymore but most of its former directorates are still alive and kicking in one form or another. While KGB (Committee of State Security) and its military counterpart GRU controlled nearly the complete intelligence system in the old days, a number of the new agencies come now under various ministries. A large part of the state security tasks are now handled by the FSB (formerly FSK and successor to the KGB).

The Federal Agency for Government Communications and Information (FAPSI), comprised of the former KGB 8th Chief Directorate and 16th Directorate, controls the country's communications networks and runs most electronic intelligence functions in Russia. According to a decree dated April 3, 1995, FAPSI is empowered to monitor and register all electronic financial and securities transactions in Russia, and to monitor other electronic communications, including private Internet access.

The SVR is the foreign intelligence service who was known as CSR till December 1991 and became part of the Ministry of Security (MB) under the new name 'SVR'. MB was in existence from 1991 to 1993 and was the initial successor to the KGB. In December 1993, SVR became an independent agency. The SVR has offices in Russian embassies, consulates and trade establishments throughout the world.

The Russian Federal Security Service (FSB), responsible for internal Russian law and order AND counterintelligence activities. Originally the Federal Counterintelligence Service (FSK), the FSB was established in 1991 by president Boris Jeltsin as one of the successors to the KGB. The FSK was subordinate to the short-lived MB but became an independent

agency in 1993 under the new name 'FSB'.

The Russian Presidential Security Service (PSB), formerly the 9th Chief Directorate of the KGB, was established as an independent government agency in December 1993. In addition to providing security for Russian top officials and the guards for the Kremlin, the PSB supervises top-level government communications, operates and protects underground command centers, maintains the special underground train system that connects key government facilities in the Moscow area, and protects other strategic facilities, and executive aircraft and special trains. Those trains are an interesting item for us as well as the Russian Civil Railway Authority is also on SW. Leadership communications are carried out from the trains when a Soviet/Russian leader travels by train. The train was popular by president Brezhnev, who never flew except when he absolutely had to and then only outside the borders - and always used these trains. The trains are mostly used for their strategic rocket forces, a lot of which is rail-mounted.

FAPSI is in fact the agency who is responsible for state communications and signals security. The agency was also one of the former KGB directorates, handling Federal communications and was responsible for the encryption of the government's messages; tasks they still carry out today. The agency operates a HF/satellite network, for both SIGINT purposes and transmission of government and intelligence traffic. Like the KGB in the old days, FAPSI works closely together with the GRU, Russia's military intelligence organization. They even share the SIGINT facilities around the world, lots of them located in embassies and consulates. In 1993 Russia closed a contract with Vietnam to ensure the continuing use of the SIGINT facilities in Cam Ranh Bay. In 1994 the Russians came to an agreement with the Latvian government, which gives them the right to use the SIGINT station in Skrunda till 1998. Russia's largest SIGINT facility abroad is the one in Lourdes (Cuba). Most of the RTTY and numbers transmissions heard in North America originate from various transmitter sites in Cuba. There are also SIGINT/tx facilities in Nicaragua.

SOUND was an alliance of the intelligence agencies of the Communist block and its databases were accessible by all members of the former block. The members of SOUND were the Soviet Union, Bulgaria, Hungary, Poland, Czechoslovakia, Mongolia, Cuba, East Germany and Vietnam. After the collapse of the block also SOUND's days were numbered. One of the main computer centres was in East Germany, and after East and West Germany reunited, the Stasi archives were soon in the hands of the BND, the West German intelligence agency. Nevertheless, it is believed that SOUND stayed in business for at least a couple of years but now as a Russian enterprise, possibly with the help of a few friendly nations like Roumania, Vietnam and Cuba. As most of the traffic was between diplomatic establishments, the assumption was made that a major part of the traffic was now diplo traffic (a large portion probably always was, even in the early days!) In the spring of 1996, I was

informed that SOUD was definitely out of business but no-one could tell me exactly who was now in control of the network. Although I haven't got a written statement from Boris in Moscow, it is safe to assume that most of the traffic nowadays is diplo material and SVR traffic, transmitted by FAPSI.

So, how shall we call the players on this net from now on? Although the major part of the traffic most probably originates from diplo sources and SVR, my personal vote goes to FAPSI as they are responsible for all comms from and to the embassies/consulates/MFA/SVR/FSB. GRU uses the same SIGINT facilities as FAPSI does, but seem to use mainly satellites for their communications.

I think we shouldn't use the other reported names anymore. Someone asked me once if the 'Brotherhood' was the same as the American 'White Supremacy' organization. The answer is a big -NO-. In the early days, when we didn't know who was using the net, we called them 'the Brotherhood', which was just our internal nickname for the net. Heck, I didn't even know there was another one :-)

Another name we should not use anymore is of course SOUD. Finally we've got 'DoSC', the Department of State Communications, but isn't that the same as FAPSI? It is of course up to you how you want to call this net in your logs. From now on, I will refer to them as FAPSI though. When it comes to the numbersstations transmitting from Cuba, I suggest we'll call them 'SVR'.

Right, that was a lot of intel talk. Because I received quite a lot of questions about the subject, I thought it would be a good thing to explain in a nutshell who KGB's successors are. Now then, I think it is wrong to put too much stress on the intelligence side of the network, so let's focus on the diplo traffic. 'Ok, but why switch to diplo and why is a new intelligence net like SOUD unlikely?', you may ask. Let's look at some of the facts so far.

- o All links begin or end either in Cuba or near Moscow, while the other side of the links are mostly diplomatic and trade establishments like embassies and consulates. Part of the traffic will consist of intel/military related nature but most of the traffic is -and probably always was- standard Russian embassy traffic! Since all messages basically look the same, it is however impossible to differentiate between diplo, intel or military related embassy traffic.
- o Most of the calls from the early days are still around. (UDZ21, KUA, RPO, EWZ42, JUA, WQL, etc....) meaning that we have still the same players on the net.
- o Some that seem to have disappeared have changed to another mode (CW --> Baudot --> Crowd36) like FQX and KUA

- o RCF no longer uses RCF as a call but is still around as a transmitter site, using a different call on each circuit.
- o The way of operating is very similar to other Eastern European DIPLO networks (like the Bulgarians, Yugoslav, Czech and Slovak).
- o All links end either in Cuba or in the vicinity of Moscow.
- o QSF messages during important Russian holidays. If this were to be a multinational intel operation, they probably wouldn't have taken these holidays so seriously. Even the Israeli<->German link works 365 days per week, ignoring the Jewish sabbath and other even more important events.
- o If you count all existing FAPSI links, you would probably end up having all the world collaborating with the Russian Intelligence to feed SOUD.
- o Good operator discipline - fine, not much different to the Bulgarians and the YUG DIPLO operators.
- o Rarely any chat traffic but when chat traffic, then always in Russian, using 3rd shift cyrillic. Wouldn't be so if it was an international operation.
- o Always 500 Hz shift! In other multinational operations, the operators never adjust the shift to hide their identity!
 Moscow RK2 500Hz <--> Tel Aviv M4W 340 Hz
 Warsaw SNG202 500Hz <--> Bucharest YPM69 400 Hz
 Rome WJI 850 Hz <--> Tel Aviv 340 Hz
 Germany 190 Hz <--> Tel Aviv 340 Hz
 etc.....
 Have you ever noticed a station belonging to the FAPSI net using a shift other than 500 Hz ?
- o Occasionally we caught long Russian chats, mentioning the diplomatic pouch and lots of personal stuff. Personal stuff like this would never be allowed on a net used purely for intel purposes.
- o If our network were to be intel only..... then where are the Russian diplos? Every Russian embassy has HF antennae but not every one seems to have SAT-equipment....
- o After the collapse of the Warsaw Pact an international intel net as SOUD should have reduced traffic, but it didn't! Links should have vanished, but they didn't, in fact we have as many as in the early days, if not more.
- o Circular traffic (KUL, VKX, RAU, ... traffic) can be noted on YUG, BUL, CZE, SVK diplo nets in a very similar manner. The only difference is,

that our bunch encrypts all the time!

- o A typical DIPLO characteristic is the use of different modes, depending on the level of flexibility and security you want on a specific link. What modes can be noticed on FAPSI transmitter sites? Standard Baudot F1B-75/100/200 + CROWD36 (on- and offline encrypted) + IRA-ARQ on the Moscow - Cuba link and to some extent 12-channel PSK traffic alternating with online encrypted Crowd36. It seems that links to the very important embassies are being established using online encrypted Crowd36.

This wide variety of modes is not unusual and can be seen on many other diplo nets as well.

Yugoslavia: FEC-A-144 + F1B-75
Czech Rep.: IRA-ARQ + F1B-100 + High speed QPSK
Hungary : HNG-FEC + DUP-ARQ
Norway : SITOR-A + TWINPLEX + DUP-ARQ-2
Turkey : RS-ARQ-228.65/240.81 + FEC-A-144
India : VFT:FEC-A-96 + F1B-50 + PSK (tests?)
Italy : ARQ-E-96 + SITOR-A + RS-ARQ + 1200bd PSK or FSK
Germany : ARQ-E-96 + RS-ARQ-228.65/240.81/ + 2400bps PSK
France : FEC-A-192/384 + TT2300B
etc. etc. etc.

*** NETWORK SPECIFICS - MODES, FREQS, LINK ID's AND CALLSIGNS ***

Modes:

Crowd36 40/10 bd 32 tones (+ selcall system)
12-channel PSK
IRA-ARQ 110.2 bd / 500 Hz shift
IRA-ARQ 300.5 bd / 500 Hz shift
Baudot 50 bd / 500 Hz shift
Baudot 75 bd / 500 Hz shift
Baudot 100 bd / 500 Hz shift
Baudot 200 bd / 500 Hz shift
Mazielka 6-tone selcall system

4-letter combinations have been noted on the Crowd36 links. These sequences most probably are used to trigger the computers on the receiving side. The following sequences were copied: VDAA, VDAG, VDBA, VDBE, VDCB, VDCE, VDCF, VDEA, VDFB, VDGB. So far they have been noted when...

- a) changing from 40Bd to 10Bd
- b) changing from 10Bd to 40Bd
- c) shutting down the link
- d) they are often sent in the middle of an ongoing transmission

Numbers transmissions and 'our' network.

One of the monitors sent me his very interesting findings as you can read hereafter. 14747 and 14787 kHz seem to be quit interesting places. Here are the relevant quotes from the reports:

.....the testing that has been taking place the least several months on 14747. The use of this frequency is strange. It's almost like it's programed as a test freq. I have seen tests of virtually every mode and service on this freq in the last few months.
This morning at 1550Z (12-12-'96) I tuned to this freq and heard the mark tone but I though I heard voice on it. I switched to AM mode and, to my surprise, there was a mechanical male voice counting in English like so: one, one, one, one, one, two, two, two, two, two, three, three, three, three, three four, four, four, four, four on up through nine. Then instead of zero, a word that very distinctly sounded like "VEEL" pronounced like the english word "veal" (as in the meat) and rhying with the word "reel". There was much clicking, buzzing and occassional distortion - like the operator was adjusting the audio output of the numbers generator. There were frequent long pauses interspersed with number combinations like one, one, or four, five, and frequently "veel, one; veel one" After a while it settled down to repeated counts of "one, two, three, one, two three" This went on for another 5 minutes or so. And then came Spanish numbers. Pretty much the same routine, but now a male in Spanish: "uno, dos, tres, quatro" and so on up to "cero." Sometimes just long counts of "uno, uno, uno, uno, uno" Now interestingly enough, the Spanish numbers stop and I hear a female voice repeating in English "five, two, nine; five two nine; five two nine. Then a series of clicks, clacks and a a long period (maybe 20 minutes) of what sounds like heavy 60 Hz hum. Then back to male English repeating "one, two, three; one, two, three." And underneath the male voice I hear a female voice repeating the "five, two, nine" routine again and what sounds like audio feedback. The station abruptly goes down at 1659Z. Maybe they can't afford a dummy load, or didn't know they were actually on the air or just didn't care, but these guys were certainly adjusting their numbers transmissions' audio."

Another example: on Feb.7, 1997 a carrier came up on 14787 around 1515Z. Steady carrier for about 5 min. Then FSK vvvvv's. Then 75bd 4646464646's. Then 100bd 4646464's followed by a carrier. The 300.05 bd data (I assume was IRA-ARQ). Then about 30 minutes of adjusting voice generation equipment again in both Spanish and English. Then on to CW "989 20" repeated then on to 20 group text with lots of 12345's in it (obviously test tfc). Then turns keyer speed up to about 45 WPM and more test CW. Finishes with 989 TTTTT (real typical ex-KGB style, right?). Finally goes down at 1807Z.

Several times recently, on 14787 after the carrier was on for a while, I heard some "noise" slightly off freq. On tuning exactly 1.75 KHz higher I found a digital signal with following characteristics: 292.75bd 185Hz

shift ACF=10. The strange thing is this signal is directly "coupled" with the carrier on 14787. When the carrier on 14787 went down so did the digital 1.75 kHz higher. I don't think it is a mixing product. It's too strong (same signal strength as the carrier below) and very pure. I have heard this on three different occasions now, and always only after the carrier comes up on 14787 for a few minutes first. Almost like the carrier is a "pilot" signal.....

Frequencies / call signs / link id's

The following list contains actual monitoring results of the past two years. First however a list of call signs / links that haven't been reported during the past few years. They may pop up one of these days; you'll never know.....

80031, ACD, BLA, BNV, BXL, CMU, DMA, DPL, DSG, EWZ 40, FJN, FRU, GLK, KDN, LSG, NDO, NMZ, OBX, OTD, OWR, PSN, PTF, RCF, RCX 81, RFA, RKG, RKM, RMM, RQO, RSS, RXX, RZJ, SCJ, TRP, Udz 27, WKL, WNK

Most transmissions come from either Moscow or Cuba. Only a few other locations are known.

Note: station RCF (Moscow) still exists but uses nowadays other call signs; a different one on each link.

Managua	= WFO (link with MIG - Cuba)
Cuba	= MIG (link with WFO - Managua)
Cuba	= COY 851 (link with YFC)
Mexico City	= GMN (not confirmed)
Baghdad	= KUA (not confirmed; link with KKK - Moscow)
London	= UXW (not confirmed; link with RLX - Moscow)
Moscow	= RCF (now inactive)
Moscow	= VNB (link with WQL)
Moscow	= RVV (link with DZR)
Moscow	= WCD (link with LKF)
Moscow	= KKK (link with UXW - London)
Moscow	= RLX (link with KUA - Baghdad)
Moscow	= RGA (link with BFR)
Moscow	= RBP 71 (link with RVC 47)
Moscow	= RK2 (link with M4W - Mossad)
Moscow	= JSC (link with POU -not 100% certain-)

Other transmissions from Moscow were to CAZ, DKR, EWZ 42, FQX, GOD, JUA, KRN, KUL, NOB, NQX, RAD, RAU, RJA, RKD, RPO, RSZ, Udz 21, UGO, VKX, VTX; all unidentified locations.

Note: JSC and POU were both copied on link 00190. It is however not clear whether POU replaced JSC or that JSC and POU are both ends of

this link.

Other transmissions from Cuba were to BAR, BPA, HZW, JMS, KAC, NDO, PSN, SPK, WNY, YBU; all unid locations.

Frequency	Station	ITU	Callsign	To	Link	UTC
-----	-----	---	-----	-----	-----	-----
4491.00	Moscow	RUS				12.00
4616.00	Moscow	RUS				1.00
4873.00	Moscow	RUS		KUL	00142	18.50
4880.00	Moscow	RUS		KUL	00142	18.52
5070.00	Moscow	RUS			70026	17.54
5426.00	Moscow	RUS				1.00
5433.00	Moscow	RUS	VNB	WQL	80061	15.33
5438.00	Unid	???				17.24
5753.00	Moscow	RUS		DKR	70060	19.00
5775.00	Moscow	RUS	VNB	WQL	80061	16.10
6798.00	Moscow	RUS		KUL	00142	19.15
6803.00	Moscow	RUS				1.00
6814.00	Moscow	RUS				1.00
6817.88	Moscow	RUS				1.00
6842.00	Moscow	RUS	VNB	WQL	80061	15.25
6872.00	Moscow	RUS				1.00
6903.00	Unid	RUS				1.00
7444.00	Moscow	RUS			70026	12.54
7520.00	Moscow	RUS	RVV	DZR	00149	16.35
7525.00	Moscow	RUS	RVV	DZR	00149	16.25
7560.00	Moscow	RUS			90223	18.35
7570.00	Moscow	RUS			90039	17.50
7635.00	Unid	RUS				1.00
7690.00	Unid	RUS				1.00
7692.00	Unid	???				16.35
7718.00	Moscow	RUS				3.00
7730.00	Moscow	RUS			60179	16.31
7810.00	Moscow	RUS	WCD	LKF	00031	8.12
7821.00	Moscow	RUS		DKR	70060	14.50
7823.00	Cuba Relay	CUB		JMS	00127	12.03
7823.00	Moscow	RUS		DKR	70060	16.50
7823.00	Moscow	RUS	WCD	LKF	00031	12.03
7826.00	Moscow	RUS		VTX	00098	20.14
7887.00	Unid	RUS				11.00
7920.00	Russian Emb London	G	UXW	RLX	40034	14.45
8008.00	Unid	RUS				1.00
8023.00	Unid	???	LKF	WCD	00031	14.02
8032.00	Unid	RUS				2.00
8059.00	Moscow	RUS	RBP 71	RVC 47	20087	17.55
8062.00	Moscow	RUS		RJA	90051	0.00
8067.00	Moscow	RUS			70026	12.43

8089.00	Unid	RUS				3.00
8091.00	Moscow	RUS				11.00
8110.00	Unid	RUS				1.00
8117.00	Moscow	RUS				17.40
8165.00	Moscow	RUS		KUL	00142	7.27
8165.00	Moscow	RUS		KUL	00142	13.55
8169.00	Moscow	RUS			60047	16.42
8179.00	Unid	RUS				1.00
9031.00	Unid	RUS				1.00
9075.00	Moscow	RUS		CAZ	50002	18.55
9088.00	Moscow	RUS		POU	00190	17.40
9118.00	Unid	RUS				3.00
9127.00	Moscow	RUS			30044	16.10
9132.00	Moscow	RUS		DKR	70060	19.01
9162.00	Moscow	RUS			20043	16.10
9169.00	Moscow	RUS			40007	17.35
9172.00	Moscow	RUS				12.00
9213.00	Cuba Relay	CUB		GMN	00119	0.45
9215.00	Moscow	RUS	VNB	WQL	80061	15.30
9237.00	Unid	???	RVC 47	RBP 71	20087	17.55
9244.00	Moscow	RUS	RGA	BFR	00030	15.02
9274.00	Moscow	RUS			0?016	17.15
9288.00	Moscow	RUS		NOB	70004	14.25
10125.00	Unid	???				13.50
10135.00	Moscow	RUS			60047	16.53
10140.00	Moscow	RUS		KUL	00142	13.55
10156.00	Moscow	RUS				3.00
10176.00	Unid	RUS				12.00
10178.00	Unid	RUS				10.00
10183.00	Moscow	RUS		VKX	00166	10.36
10196.00	Unid	???				10.00
10202.00	Unid	???				9.25
10218.00	Moscow	RUS		JUA	50035	15.57
10222.00	Russian Emb London	G	UWX	RLX	40034	18.43
10244.00	Unid	???				14.45
10260.00	Moscow	RUS		JUA	50035	17.05
10287.00	Unid	???		JSC	00190	17.40
10327.00	Unid	RUS				10.00
10410.00	Moscow	RUS		KUL	00142	7.15
10422.00	Cuba Relay	CUB		BPA	00116	15.26
10422.00	Cuba Relay	CUB		BAR	00135	15.24
10425.00	Moscow	RUS				2.00
10426.00	Unid	???				15.06
10426.00	Unid	???	WQL	VNB	80061	13.08
10427.00	Moscow	RUS				2.00
10453.00	Moscow	RUS		DKR	70060	15.12
10453.00	Moscow	RUS				17.35
10482.00	Moscow	RUS		RJA	90051	18.18

10482.00	Moscow	RUS	VNB	WQL	80061	12.30
10482.00	Unid	???	WQL	VNB	80061	8.45
10485.00	Unid	???	WQL	VNB	80061	16.15
10519.00	Unid	RUS				10.00
10582.00	Moscow	RUS		KUL	00142	14.20
10584.00	Moscow	RUS		KUL	00142	14.19
10586.00	Moscow	RUS		KUL	00142	14.25
10588.00	Moscow	RUS				10.00
10594.00	Moscow	RUS				2.00
10625.00	Moscow	RUS				1.00
10627.00	Moscow	RUS				2.00
10650.00	Moscow	RUS		DKR	70060	16.15
10650.00	Moscow	RUS		NOB	70004	12.20
10650.00	Moscow	RUS		DKR	70060	8.40
10655.00	Moscow	RUS		NOB	70004	7.55
10658.00	Unid	RUS				2.00
10672.00	Moscow	RUS	RVV	DZR	00149	16.25
10677.00	Moscow	RUS				1.00
10686.00	Moscow	RUS				12.25
10723.00	Moscow	RUS			00097	15.40
10735.00	Moscow	RUS		RJA	90051	15.32
10744.00	Moscow	RUS		NQX	00052	9.15
10748.00	Unid	???				8.08
10760.00	Unid	???			10075	15.05
10762.00	Unid	???				14.48
10767.00	Moscow	RUS	RGA	BFR	00030	15.00
10767.00	Moscow	RUS	RGA	BFR	00030	15.00
10767.00	Moscow	RUS	RGA	BFR	00030	7.30
10767.00	Moscow	RUS	RGA	BFR	00030	9.00
10817.00	Moscow	RUS			60069	15.40
10850.00	Moscow	RUS	KKK	KUA	30022	19.04
10855.00	Unid	RUS				10.41
10865.00	Moscow	RUS				17.05
10912.00	Moscow	RUS		DKR	70060	8.55
10915.00	Moscow	RUS		RPO	80038	15.05
11024.00	Moscow	RUS		RPO	80038	14.32
11024.00	Moscow	RUS			30044	9.59
11024.00	Moscow	RUS			30088	14.20
11027.00	Moscow	RUS		NOB	70004	14.00
11051.00	Moscow	RUS	RGA	BFR	00030	8.05
11051.00	Moscow	RUS				10.00
11060.00	Unid	RUS				2.00
11070.00	Moscow	RUS				2.00
11112.00	Moscow	RUS	RLX	UXW	40034	16.25
11132.00	Moscow	RUS		VKX	00166	12.00
11143.00	Moscow	RUS				12.27
11402.00	Unid	RUS				15.56
11412.00	Moscow	RUS			60069	16.12

11413.00	Moscow	RUS		60069	15.36
11421.00	Moscow	RUS RVV	DZR	00149	15.27
11426.00	Unid	??? WQL	VNB	80061	8.47
11428.00	Moscow	RUS RVV	DZR	00149	8.35
11433.00	Moscow	RUS KKK	KUA	30022	15.50
11434.00	Moscow	RUS		10042	18.25
11436.00	Moscow	RUS RVV	DZR	00149	15.40
11440.00	Russian Emb Baghdad	IRQ KUA	KKK	30022	11.31
11446.00	Moscow	RUS			10.00
11460.00	Unid	??? DZR	RVV	00149	15.32
11468.00	Unid	??? DZR	RVV	00149	14.26
11477.00	Moscow	RUS			14.40
11480.00	Moscow	RUS			12.00
11487.00	Moscow	RUS		30044	14.38
11502.00	Moscow	RUS			11.00
11507.00	Moscow	RUS	RPO	80038	15.05
11523.00	Cuba Relay	CUB	GMN	00119	0.45
11527.00	Moscow	RUS VNB	WQL	80061	10.50
11527.00	Moscow	RUS VNB	WQL	80061	15.40
11541.00	Moscow	RUS	JUA	50035	17.13
11562.00	Moscow	RUS	DKR	70060	6.23
11567.00	Moscow	RUS VNB	WQL	80061	13.08
12111.00	Moscow	RUS	NOB	70004	13.20
12111.00	Moscow	RUS	UDZ 21	20054	15.17
12112.00	Moscow	RUS RBP 71	RVC 47	20087	15.43
12124.00	Moscow	RUS	VKX	00166	12.05
12128.00	Moscow	RUS		06019	10.15
12130.00	Moscow	RUS	VTX	00098	15.55
12132.00	Moscow	RUS RVV	DZR	00149	9.20
12134.00	Moscow	RUS	VTX	00098	15.35
12136.00	Unid	??? DZR	RVV	00149	15.32
12137.00	Unid	???		00162	10.10
12139.00	Unid	???			15.53
12145.00	Moscow	RUS	VKX	00166	11.08
12146.00	Moscow	RUS		10042	11.43
12150.00	Moscow	RUS			12.00
12151.00	Unid	???			15.15
12152.00	Unid	???			17.17
12152.00	Moscow	RUS	DKR	70060	9.45
12155.00	Unid	???			8.03
12156.00	Moscow	RUS RCF			14.54
12156.00	Moscow	RUS			7.54
12157.00	Moscow	RUS	RAD		9.18
12158.00	Moscow	RUS	DKR	70060	8.40
12160.00	Moscow	RUS			9.25
12167.00	Moscow	RUS	NOB	70004	12.50
12171.00	Moscow	RUS	NOB	70004	12.55
12173.00	Moscow	RUS			1.00

12173.00	Unid	RUS				2.00
12174.00	Moscow	RUS	NQX	00052		13.30
12177.00	Moscow	RUS	VKX	00166		11.10
12177.00	Moscow	RUS				2.00
12177.00	Moscow	RUS	NOB	70004		12.50
12178.00	Moscow	RUS	KUL	00142		14.10
12180.00	Moscow	RUS	VKX	00166		15.12
12180.00	Moscow	RUS	RAU	00070		14.28
12181.00	Moscow	RUS				1.00
12181.00	Moscow	RUS				2.00
12183.00	Moscow	RUS				10.00
12185.00	Cuba Relay	CUB	COY 851 YFC	00103		14.00
12193.00	Moscow	RUS	KUL	00142		14.15
12194.00	Moscow	RUS	NQX	00052		9.43
12195.00	Unid	???	GOD	00090		16.30
12196.00	Cuba Relay	CUB	MIG WFO	00125		19.57
12196.00	Cuba Relay	CUB	MIG WFO	00125		14.45
12197.00	Moscow	RUS	KUL	00142		14.12
12197.00	Moscow	RUS	NOB	70004		13.00
12198.00	Moscow	RUS	KUL	00142		14.10
12198.00	Unid	RUS				2.00
12202.00	Unid	RUS				10.00
12211.00	Moscow	RUS	RLX UXW	40034		9.26
12223.00	Moscow	RUS	UDZ 21	20054		17.30
12228.00	Moscow	RUS		70026		10.09
12239.00	Unid	???	BFR RGA	00030		15.05
12262.00	Unid	???				12.40
12332.00	Moscow	RUS		10042		14.36
13016.00	Cuba Relay	CUB	MIG WFO	00125		14.17
13384.00	Moscow	RUS		10042		8.22
13392.00	Moscow	RUS	VTX	00098		8.19
13393.00	Moscow	RUS	FQX	60003		15.56
13393.00	Cuba Relay	CUB	HZW	00117		20.00
13398.00	Moscow	RUS				10.00
13417.00	Moscow	RUS				11.00
13418.00	Moscow	RUS	RBP 71 RVC 47	20087		14.20
13420.00	Moscow	RUS				12.41
13422.00	Moscow	RUS	VNB WQL	80061		10.20
13425.00	Moscow	RUS	VNB WQL	80061		8.53
13429.00	Moscow	RUS	VNB WQL	80061		10.29
13430.00	Moscow	RUS		00097		15.27
13443.00	Moscow	RUS				9.00
13450.00	Moscow	RUS	RGA BFR	00030		8.00
13457.00	Moscow	RUS				13.19
13459.00	Unid	???				12.50
13460.00	Moscow	RUS	RGA BFR	00030		15.43
13462.00	Moscow	RUS				6.42
13489.00	Unid	RUS				10.00

13503.00	Moscow	RUS	RLX	UXW	40034	10.00
13506.00	Moscow	RUS	RLX	UXW	40034	9.10
13507.00	Moscow	RUS	RLX	UXW	40034	9.20
13508.00	Moscow	RUS				7.00
13520.00	Unid	???				11.00
13530.00	Moscow	RUS			12311	8.00
13557.00	Unid	RUS				1.00
13584.00	Moscow	RUS				10.00
13835.00	Cuba Relay	CUB	COY 851	YFC	00103	13.39
13838.00	Cuba Relay	CUB	COY 851	YFC	00103	13.37
13850.00	Moscow	RUS		NQX	00052	13.30
13858.00	Moscow	RUS				11.22
13867.88	Moscow	RUS				12.32
13877.00	Moscow	RUS		RAU	00070	7.00
13880.00	Moscow	RUS		RAU	00070	8.10
13982.00	Moscow	RUS			60047	8.39
14363.00	Moscow	RUS		DKR	70060	8.38
14364.00	Unid	???	RVC 47	RBP 71	20087	13.41
14373.00	Cuba Relay	CUB		KAC	00128	20.55
14377.00	Moscow	RUS		DKR	70060	8.42
14377.00	Moscow	RUS		DKR	70060	8.19
14387.00	Moscow	RUS				1.00
14393.00	Moscow	RUS				10.00
14398.00	Unid	RUS				1.00
14401.00	Moscow	RUS				10.00
14402.00	Moscow	RUS				2.00
14402.00	Moscow	RUS				10.05
14408.00	Moscow	RUS	RG	BFR	00030	9.45
14412.00	Moscow	RUS		FQX	60003	16.00
14416.00	Moscow	RUS				2.00
14417.00	Unid	???	YFC	COY 851	00103	13.30
14418.00	Unid	RUS				2.00
14419.00	Moscow	RUS				13.31
14420.88	Moscow	RUS				13.36
14421.00	Moscow	RUS				10.00
14427.00	Russian Emb London	G	UXW	RLX	40034	9.27
14434.00	Moscow	RUS				14.55
14455.00	Moscow	RUS	RVV	DZR	00149	15.36
14465.00	Unid	???		KRN	00178	17.43
14473.88	Moscow	RUS			90039	12.07
14474.00	Moscow	RUS			90039	12.07
14475.00	Moscow	RUS			60047	8.16
14496.00	Unid	???			20076	12.20
14506.00	Unid	RUS				6.00
14525.00	Unid	???			20076	12.25
14532.00	Moscow	RUS		UDZ 21	20054	15.00
14563.20	Unid	RUS				2.00
14577.00	Moscow	RUS		RPO	80038	14.59

14587.00	Moscow	RUS	RPO	80038	14.50
14589.00	Moscow	RUS	RPO	80038	14.37
14605.00	Moscow	RUS	VKX	00166	15.01
14605.00	Moscow	RUS	VKX	00166	16.10
14605.00	Moscow	RUS	VKX	00166	10.40
14608.00	Moscow	RUS	VKX	00166	15.00
14622.00	Moscow	RUS	VKX	00166	12.18
14622.00	Russian Emb Baghdad	IRQ KUA	KKK	30022	10.56
14624.00	Russian Emb Baghdad	IRQ KUA	KKK	30022	11.15
14625.00	Moscow	RUS	RSZ	00099	14.28
14630.00	Moscow	RUS			11.48
14632.00	Russian Emb Baghdad	IRQ KUA	KKK	30022	12.30
14638.00	Moscow	RUS		30011	10.55
14640.00	Moscow	RUS KKK	KUA	30022	15.12
14642.00	Unid	RUS			2.00
14642.00	Moscow	RUS		30011	10.50
14642.00	Moscow	RUS		10042	7.53
14643.00	Moscow	RUS KKK	KUA	30022	9.40
14648.00	Moscow	RUS		00198	11.30
14649.00	Moscow	RUS			9.00
14657.00	Moscow	RUS			7.50
14659.00	Unid	RUS			10.00
14660.00	Moscow	RUS		10042	9.15
14686.00	Moscow	RUS			1.00
14713.00	Unid	RUS			9.20
14713.00	Moscow	RUS			12.00
14724.50	Cuba Relay	CUB	BAR	00135	15.15
14726.00	Unid	RUS			10.00
14727.00	Cuba Relay	CUB	BPA	00116	18.00
14728.88	Unid	RUS			1.00
14736.00	Cuba Relay	CUB MIG	WFO	00125	14.18
14817.00	Moscow	RUS		43323	8.33
14820.00	Moscow	RUS			14.20
14820.00	Moscow	RUS	EWZ 42		15.55
14821.00	Moscow	RUS		40023	8.38
14822.00	Moscow	RUS		60069	16.21
14823.00	Unid	RUS			10.00
14823.00	Moscow	RUS			6.00
14823.00	Moscow	RUS			11.00
14824.00	Moscow	RUS			13.07
14830.00	Unid	??? BFR	RGA	00030	15.22
14830.00	Unid	??? BFR	RGA	00030	14.40
14832.00	Unid	???			16.05
14834.00	Moscow	RUS	RKD		16.10
14838.00	Unid	RUS			2.00
14842.00	Unid	RUS			15.10
14852.00	Moscow	RUS	VKX	00166	11.00
14854.00	Moscow	RUS			16.58

14854.00	Moscow	RUS	UDZ 21	20054	16.35
14863.00	Unid	RUS			11.53
14865.00	Moscow	RUS			2.00
14866.00	Moscow	RUS		60069	7.44
14869.00	Moscow	RUS			10.35
14870.00	Moscow	RUS			14.33
14870.00	Unid	RUS			2.00
14892.00	Unid	RUS			2.00
14894.00	Moscow	RUS			13.44
14900.00	Moscow	RUS			13.31
14917.00	Moscow	RUS	RJA	90051	9.57
14927.00	Moscow	RUS			7.28
14938.00	Moscow	RUS			10.34
14941.00	Cuba Relay	CUB	WNY	00139	18.00
14942.00	Moscow	RUS			1.00
14946.00	Moscow	RUS			9.26
14947.00	Moscow	RUS		30088	10.07
14950.00	Unid	RUS			14.30
14971.00	Moscow	RUS	RAU	00070	14.10
14973.00	Moscow	RUS	RAU	00070	14.12
14974.00	Moscow	RUS	RAU	00070	14.12
14977.00	Moscow	RUS	RAU	00070	14.12
14980.00	Moscow	RUS	RAU	00070	14.10
14985.00	Moscow	RUS	RAU	00070	14.10
14986.00	Moscow	RUS			14.15
15612.00	Moscow	RUS			1.00
15678.00	Moscow	RUS	NQX	00052	11.50
15678.00	Moscow	RUS	NQX	00052	12.44
15684.00	Moscow	RUS			10.00
15696.00	Moscow	RUS RGA	BFR	00030	11.50
15696.00	Moscow	RUS			14.50
15702.00	Moscow	RUS RGA	BFR	00030	10.48
15707.00	Moscow	RUS		60047	13.00
15708.00	Moscow	RUS RGA	BFR	00030	15.30
15710.00	Moscow	RUS KKK	KUA	30022	14.58
15712.00	Moscow	RUS			11.50
15722.00	Moscow	RUS RGA	BFR	00030	11.05
15724.00	Moscow	RUS	RPO	80038	8.29
15733.00	Moscow	RUS		30088	12.05
15735.00	Moscow	RUS	FQX	60003	17.30
15735.00	Moscow	RUS	FQX	60003	16.00
15771.00	Moscow	RUS	RSZ	00099	15.20
15826.00	Moscow	RUS RLX	UXW	40034	9.45
15826.00	Unid	???			9.30
15836.00	Moscow	RUS	RAD		12.53
15836.00	Moscow	RUS			12.05
15845.00	Moscow	RUS		07039	10.00
15845.00	Moscow	RUS			1.00

15879.00	Moscow	RUS		00198	11.32
15880.00	Moscow	RUS			12.50
15889.00	Cuba Relay	CUB	SPK	00168	16.00
16008.00	Moscow	RUS		10163	9.20
16018.00	Moscow	RUS		10163	12.33
16032.00	Moscow	RUS		30088	9.55
16054.00	Moscow	RUS	KKK KUA	30022	10.10
16054.00	Moscow	RUS	KKK KUA	30022	10.46
16064.00	Moscow	RUS	KKK KUA	30022	10.53
16066.00	Moscow	RUS		11230	9.43
16081.00	Moscow	RUS	VKX	00166	9.33
16108.00	Moscow	RUS			7.54
16108.00	Moscow	RUS	UDZ 21	20054	11.50
16108.00	Moscow	RUS	UDZ 21	20054	7.06
16116.00	Moscow	RUS		60047	10.50
16119.00	Unid	RUS			9.00
16120.00	Unid	???		40078	9.40
16121.00	Unid	RUS			2.00
16129.00	Mossad	ISR	M4W RK2		8.30
16145.00	Moscow	RUS			10.00
16153.00	Moscow	RUS	DKR	70060	8.35
16153.00	Moscow	RUS			2.00
16154.00	Moscow	RUS	DKR	70060	8.45
16154.88	Moscow	RUS			1.00
16155.00	Moscow	RUS			10.05
16165.00	Moscow	RUS			1.00
16168.00	Moscow	RUS		30044	15.20
16214.00	Moscow	RUS	FQX	60003	9.54
16214.00	Moscow	RUS		60015	10.25
16218.00	Cuba Relay	CUB	HZW	00117	20.00
16225.00	Cuba Relay	CUB	BPA	00116	14.45
16226.00	Cuba Relay	CUB	YBU	00148	14.00
16232.00	Moscow	RUS	FQX	60003	8.50
16242.00	Moscow	RUS	RSZ	00099	17.00
16242.00	Moscow	RUS	RVV DZR	00149	9.40
16242.00	Moscow	RUS			4.00
16244.00	Moscow	RUS	RJA	90051	8.33
16245.00	Moscow	RUS	VKX	00166	11.00
16247.00	Moscow	RUS	RK2 M4W		8.29
16252.00	Moscow	RUS	RVV DZR	00149	11.47
16253.00	Moscow	RUS	RJA	90051	9.55
16254.00	Unid	???		20076	8.10
16255.00	Moscow	RUS	POU	00190	7.06
16257.00	Moscow	RUS	RJA	90051	8.37
16273.00	Moscow	RUS	VTX	00098	8.15
16277.00	Moscow	RUS		60069	11.15
16277.00	Moscow	RUS			11.19
16277.00	Moscow	RUS		80050	10.05

16285.00	Unid	???		00177	8.45
16285.00	Moscow	RUS	RSZ	00099	8.40
16294.00	Moscow	RUS		00029	11.12
16305.00	Unid	???	UGO	50079	9.30
16312.00	Unid	RUS			2.00
16320.00	Unid	???		40078	9.30
16324.00	Moscow	RUS KKK	KUA	30022	11.40
16332.00	Moscow	RUS		10042	8.55
16340.00	Moscow	RUS KKK	KUA	30022	14.10
16340.00	Moscow	RUS KKK	KUA	30022	11.15
16342.00	Moscow	RUS		10042	11.28
16344.00	Moscow	RUS KKK	KUA	30022	11.40
16446.00	Unid	???	KRN	00178	17.35
16446.00	Cuba Relay	CUB	WNY	00139	19.09
16841.00	Cuba Relay	CUB	JMS	00127	22.30
17402.00	Moscow	RUS		10042	8.08
17421.00	Moscow	RUS	JUA	50035	13.35
17422.00	Moscow	RUS		60047	8.25
17465.00	Moscow	RUS	RSZ	00099	10.44
17465.00	Moscow	RUS	RSZ	00099	13.45
17474.00	Unid	???		10163	9.10
17533.00	Moscow	RUS		30088	10.15
18092.00	Moscow	RUS	FQX	60003	8.42
18092.00	Moscow	RUS	FQX	60003	14.22
18183.00	Moscow	RUS			10.00
18185.00	Cuba Relay	CUB	GMN	00119	16.54
18206.00	Moscow	RUS	JUA	50035	9.35
18225.00	Moscow	RUS	VKX	00166	11.00
18245.00	Moscow	RUS		60047	10.30
18247.00	Unid	???		10079	9.30
18250.00	Moscow	RUS	JUA	50035	9.36
18251.00	Moscow	RUS		00063	12.20
18332.00	Moscow	RUS		10042	9.14
18338.88	Moscow	RUS		00096	10.35
18345.00	Moscow	RUS			2.00
18346.88	Moscow	RUS		00096	10.30
18420.00	Unid	???	UGO	50079	11.30
18424.00	Moscow	RUS		10042	14.05
18440.00	Moscow	RUS			11.40
18575.00	Moscow	RUS			11.18
18580.00	Moscow	RUS			10.45
18585.00	Moscow	RUS	CAZ	50002	10.10
18610.00	Moscow	RUS	RPO	80038	10.35
18695.00	Moscow	RUS			9.31
18752.00	Moscow	RUS		60069	7.31
18803.00	Cuba Relay	CUB	YBU	00148	14.10
18835.00	Moscow	RUS RGA	BFR	00030	14.35
18844.00	Cuba Relay	CUB	BPA	00116	16.25

18965.00	Cuba Relay	CUB	SPK	00168	16.00
19088.00	Cuba Relay	CUB	WNY	00139	18.00
19354.00	Moscow	RUS	RPO	80038	8.14
19412.00	Moscow	RUS	CAZ	50002	10.05
19559.00	Mossad	ISR M4W	RK2		8.30
20042.00	Moscow	RUS	FQX	60003	8.50
20140.00	Cuba Relay	CUB	YBU	00148	22.00
20340.00	Moscow	RUS		10042	11.10
20412.00	Moscow	RUS			10.00
20443.00	Unid	???			8.38
20690.00	Moscow	RUS	RPO	80038	11.47
20731.00	Cuba Relay	CUB	GMN	00119	17.45
21865.00	Cuba Relay	CUB	BPA	00116	16.00

Russian Civil Railway Authority

Mode: '81-81' 40.5bd / 500 Hz

Freqs: 12184 (logged between 08.30-09.30 UTC),
14985, 16315 kHz (both logged between 07.30-08.30 UTC)

Abbreviations

SOUND - Sisteme Objedinennowo Utschotja Dannych o protiwnike
[System of mutual gathering of data about the enemy]

MB - Ministertsvo Bezopasnosti (Ministry of Security)

KGB - Komitet Gosudarstvennaya Bezopasnosti [Committee of State Security]

FSB - Federalnaya Sluzhba Bezopasnosti [Federal Security Service]
(Formerly known as 'FSK' Federalnaya Sluzhba Kontrazvedky
-the Federal Counterintelligence Service-)

GRU - Glavnoye Razvedyvatelnoye Upravlenie [Military Intelligence]

SVR - Sluzhba Vneshnoi Razvedky [Foreign Intelligence Service]

FAPSI - Federalnoe Agentstvo Pravitelstvennoy svyazi i informatsii
[Federal Agency for Government Communications and Information]

CSR - Centralnaya Sluzhbza Razvedky [Central Intelligence Bureau]

PSB - Prezidentskaya Sluzhba Bezopasnosti [Presidential Security Service]

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Research / sources

Various articles and documents from:

- Defense Intelligence Agency, Washington
- Radio Free Europe / Radio Liberty Inc.
- Russian Reform Monitor
- OMRI Open Media Research Institute
- US Army Foreign Military Studies Office
- FAS Federation of American Scientists
- Intelligence Watch Report

Prof. Desmond Ball ('Soviet SIGINT')

Bodo Wegmann ('Russische Foederation')

Dr Marian Leighton ('From KGB to MFA')

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Russian Presidential Decree no.334

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